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ABSTRACT

This study investigated the effect of the development of mastery learning on the curriculum of preservice teacher education programs and the content of inservice professional development programs. Nine educational psychology textbooks, published since 1990, and three other texts used as supplementary textbooks were analyzed. The study found that 10 of the 12 textbooks included descriptions of mastery learning, with the median number of pages allocated to the subject being 2.5 in textbooks that averaged between 600 and 700 pages in length. Benjamin S. Bloom's 1968 "Learning for Mastery" article, in which the basis of mastery learning was set forth, was cited in only 5 of the 12 texts. The texts' references to research reviews, books, and individual studies are analyzed. The study concludes that most of the textbooks' descriptions were limited and imprecise, with many being conspicuously inaccurate. As a result of the cursory treatment of mastery learning in most preservice education programs, implementation efforts have depended primarily on inservice professional development activities. Mastery learning is generally well received by inservice education participants because it helps them improve their results with students by making more effective use of skills they already have, rather than drastically altering what they are doing. (Contains 85 references.) (JDD)

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Preservice and Inservice Professional Development Efforts Regarding Bloom's Learning for Mastery

Few programs have generated as much continued excitement among educators over the last twenty-five years as those based on the ideas of *mastery learning*. Few strategies also have been implemented as broadly or evaluated as thoroughly. Mastery learning programs are operating today in nations around the world and at every level of education, from preschool to graduate and professional schools (Guskey, in press). Additionally, a recent search of the Educational Resources Information Center (ERIC) system found over 1660 references to "mastery learning."

Given this level of interest and the extensive literature base now accumulated, one would expect information on mastery learning to be an integral part of both the preservice education experiences of new teachers and the inservice professional development activities of experienced teachers. But is this the case? Unfortunately, we do not know. To date there has been no systematic attempt to study the impact on preservice and inservice teacher education of the ideas set forth by Benjamin S. Bloom in his classic 1968 article, "Learning for Mastery."

The purpose of this investigation, therefore, was to determine what effect the development of mastery learning has had on the curriculum of preservice teacher education programs and the content of inservice professional development programs. Specifically, we sought to answer the following questions: (1) Is mastery learning part of the undergraduate teacher education curriculum? (2) If so, what is presented in discussions of mastery learning? (3) How accurate are the descriptions of mastery learning? (4) Is the most current evidence on the effectiveness of mastery

learning described? (5) Do preservice and inservice treatments of mastery learning differ?

Analysis Method

To determine how mastery learning is presented in preservice teacher education programs, a variety of educational psychology textbooks were gathered and their discussions of mastery learning analyzed. Educational psychology texts were selected because an informal survey of faculty members involved in preservice teacher preparation programs at a large state university indicated that discussions of mastery learning take place primarily in the undergraduate educational psychology course. The course is required in all undergraduate teacher education programs at this particular university.

A total of nine educational psychology textbooks were gathered from the individual libraries of faculty members responsible for teaching the required undergraduate educational psychology course. Only those textbooks published since 1990 were selected for analysis. Although these nine textbooks do not represent the entire population of educational psychology texts, nor a random sample of the texts available, they include most of the largest selling texts in the field and, hence, were considered to be fairly representative.

In addition to these nine textbooks, three other texts used as supplementary textbooks also were selected for analysis. These texts are widely used in both educational psychology and teaching methods courses at the undergraduate level. The 12 textbooks selected for analysis are listed in Table 1.

Insert Table 1

The analysis of each textbook's description of mastery learning began by checking the text's index for the topic "mastery learning." If listed, all pages indicated were read in their entirety, the title of the chapter in which the description appeared was noted, and all references or citations in the descriptions were recorded. If there was no listing for "mastery learning," the name of "Benjamin S. Bloom" was checked. All references to Bloom were then read in their entirety and any references to "mastery learning" or "learning for mastery" were noted. The chapter titles in which mastery learning is described and the specific pages of the description are also listed with the textbook titles in Table 1.

Textbook Analysis Results

Ten of the 12 selected textbooks included descriptions of mastery learning. The two exceptions were the Eggen and Kauchak (1992) text, which did not mention of mastery learning, and the Sprinthall and Sprinthall (1990) text, which offered no description of mastery learning, but mentioned it in a brief biographical sketch of Benjamin S. Bloom. The median number of pages allocated to descriptions of mastery learning was 2.5 in textbooks that averaged between 600 and 700 pages in length. Mastery learning was most frequently discussed under the heading of "Instructional Models," or "Accommodating Individual Differences."

Analysis of the references or citations included in the descriptions of mastery learning proved most interesting. These are outlined in Table 2. Bloom's 1968 "Learning For Mastery" article, in which he set

forth the basis of mastery learning, was cited in only five of the 12 texts. On the other hand, Carroll's 1963 article, upon which Bloom built, was cited in seven of the texts. It is apparent, therefore, that the descriptions of mastery learning offered by many educational psychology textbook authors are based on references other than Bloom's original work.

Insert Table 2

Although eight of the textbooks included references to reviews of the research literature on mastery learning, few cited the more recent reviews. For example, none included references to the comprehensive review by Guskey and Pigott (1988), and only the Biehler and Snowman (1993) text cited the most recent review by Kulik, Kulik, and Bangert-Drowns (1990a). Oddly, one of the most frequently cited reviews was that conducted by Slavin (1987), even though it has been shown to have used techniques of questionable validity (Joyce, 1987; Hiebert, 1987), employed capricious selection criteria (Anderson & Burns, 1987; Kulik, Kulik, & Bangert-Drowns, 1990b), reported results in a biased manner (Walberg, 1988), and drew conclusions not substantiated by the evidence presented (Guskey, 1987a, 1988a). In fact, in their more extensive and more methodologically sound review, Kulik, Kulik, and Bangert-Drowns (1990a) not only found mastery learning to have a consistently positive impact on a broad range of student learning outcomes, but also made clear the distorted nature of Slavin's (1987) report (Kulik, Kulik, & Bangert-Drowns, 1990b). Unfortunately, because this information is not presented in most educational psychology textbooks, it is not part of the knowledge base that is shared with prospective teachers in preservice education programs.

References to books that deal specifically with the implementation of mastery learning (Block & Anderson, 1975; Block, Efthim, & Burns; 1989; Guskey, 1985) were offered in only three of the textbooks. The Dembo (1991) text is the only one that cites all three of these references. This seems especially unfortunate, since the practical information offered in these books undoubtedly would be of keen interest to new teachers as they prepare to enter the classroom.

References to a variety of individual studies were included in the discussions of mastery learning in these educational psychology textbooks. About half of the studies cited were described as yielding positive results, while the other half yielded nonsignificant results. The most frequently referenced study was that of Arlin (1984b), which was cited in six of the 12 texts. This study typically is described as providing evidence that the use of mastery learning does *not* diminish the differences among students in terms of achievement or learning rate, unless teachers hold back the faster learners. For example, Woolfolk (1993) states:

> In practice, mastery learning has not helped to erase achievement differences among students, as some proponents have hoped. Individual differences in achievement persist, unless the teacher holds back the faster students while the slower ones catch up (Arlin, 1984b). (p. 459).

Again, however, other more recent information is ignored. A reanalysis of Arlin's data presented in Guskey and Gates (1985), and in Guskey and Pigott (1988), showed that Arlin misinterpreted his results. Over a series of instructional units the differences between fast and slow learners were *reduced* under mastery learning. In fact, Arlin's (1984b) results are quite similar to those attained by Anderson (1975, 1976) in studies conducted nearly a decade earlier. Unfortunately, this is not brought out in any of the discussions of Arlin's (1984b) study.

Finally, references to negative reviews or commentaries were noted in all ten of the textbooks that included discussions of mastery learning. In most cases, these references appear to be made in an effort to balance the authors' presentation of mastery learning. Still, there is a noticeable lack of references to works in which these criticisms have been specifically addressed (e.g. Block et al. 1989; Guskey, 1987b). In addition, most of the authors chose to end their discussion of mastery learning on a highly skeptical or obviously negative note. For example, the discussion in the Henson (1993) text ends with the following quote:

> Slavin (1989) says that "if school districts expect that by introducing group-based mastery learning ... they can measurably improve their students' achievement, there is little evidence to support them." (p. 79). (p. 154).

Similarly, the Kaplan (1990) text ends its description of mastery learning with:

> Until the criticisms described above are satisfied, mastery learning will probably not be widely used in classrooms (Horton, 1981). (p. 375).

Discussion of the Textbook Analysis

Although the vast majority of modern educational psychology textbooks include discussions of mastery learning, our analysis found most of these descriptions to be limited and imprecise. Many, in fact, are conspicuously inaccurate. For example, while informed descriptions of mastery learning have consistently emphasized that it is primarily a group-based and teacher-paced approach to instruction (Block, 1971; Block & Burns, 1976; Guskey, 1985; Guskey & Gates, 1986), many textbook authors erroneously describe it as strictly "individually-based and student paced." Henson (1993), for instance, states:

> Most mastery learning programs are student-paced (that is, the students set the pace) and individually based. Each student pursues learning individually - at that student's own preferred pace. (p. 153).

Similarly, in describing problems associated with the application of mastery learning, Woolfolk (1993) indicates:

> There are some problems with the mastery learning approach. Because all students do not cover the same material, a mastery learning course must be self-contained and cannot serve as a prerequisite for other courses. Using a mastery approach to teach Algebra I, for example, would not ensure that all students had the prerequisites for Algebra II, since some students in Algebra I might never get past solving an equation with one unknown." (p. 459).

While problems such as these are typical in programs based on Keller's (1968) "Personalized System of Instruction" model, they are rarely associated with programs based on Bloom's (1968) "Learning for Mastery" model, and researchers studying the effects of mastery learning have always noted these differences (Block & Burns, 1976; Kulik, Kulik, Bangert-Drowns, 1990a).

One reason for these inaccuracies is likely to be the lack of familiarity among textbook authors with the vast literature on mastery learning. After all, coverage of the topic of mastery learning constitutes less than one percent of the material presented in the typical educational psychology text. It seems unreasonable, therefore, to expect the authors of these texts to have expertise in every one of the many topics they must address. Nevertheless, while the lack of expertise and the need to cover a wide array of topics explains the lack of depth, it seems an inadequate explanation for inaccuracy. The fact that less than half of the descriptions of mastery learning referenced the original work of Bloom (1968), and only one in 12 cited the most recent review of mastery learning research, is more difficult to explain.

It seems likely, too, that the pressure to cover such a wide array of topics compels many educational psychology textbook authors to take shortcuts in developing their texts. Instead of reading the primary literature on a topic in order to prepare their own description, they probably read what other educational psychology textbook authors have said, then rework and occasionally update that material. As a result, inaccuracies in a few, particularly those that have already captured a large share of the textbook market, are proliferated in subsequent texts.

What is most unfortunate is that if the only information about mastery learning preservice teachers receive is in an undergraduate educational psychology course, and if that information is inaccurate, as the results of our analysis indicate it often is, then misunderstandings and misinterpretations will abound. And this will be true not only for new teachers entering the profession, but for the large number of educators at all levels who gather their information on topics such as mastery learning by reading secondary sources.

Misinterpretations of Mastery Learning

Inaccuracies regarding mastery learning are not restricted to only educational psychology textbooks. In many cases, early attempts to implement mastery learning also were based on very narrow and, in a few instances, inaccurate interpretations of Bloom's ideas. These programs attempted to break learning down into extremely small segments and insisted students "master" each segment before being permitted to move on. Many focused exclusively on lower level cognitive skills and were based on strict adherence to a rigid "scope and sequence" of learning objectives.

Teachers were regarded in these programs as little more than managers of materials and record-keepers of student progress.

Unfortunately, similar misinterpretations of mastery learning continue today (e.g., Prawat, 1992). But the narrowness and rigidity of these early programs were *never* Bloom's intent. Nowhere in his writings can even the suggestion of such be found. Bloom always considered thoughtful and reflective teachers to be essential to the successful implementation of mastery learning (Bloom, 1976). In fact, in his earliest descriptions of mastery learning, Bloom stressed flexibility in the process:

> There are many alternative strategies for mastery learning. Each strategy must find some way of dealing with individual differences in learners through some means of relating the instruction to the needs and characteristics of the learners. ... The nongraded school (Goodlad & Anderson, 1959) is one attempt to provide an organizational structure that permits and encourages mastery learning. (Bloom, 1968, pp. 7-8).

Bloom also emphasized the need to focus instruction in mastery learning classrooms on higher level learning outcomes, not simply basic skills. He noted:

> I find great emphasis on problem solving, applications of principles, analytical skills, and creativity. Such higher mental processes are emphasized because this type of learning enables the individual to relate his or her learning to the many problems he or she encounters in day-to-day living. These abilities are stressed because they are retained and utilized long after the individual has forgotten the detailed specifics of the subject matter taught in the schools. These abilities are regarded as one set of essential characteristics needed to continue learning and to cope with a rapidly changing world. (Bloom, 1978, p. 578).

Recent research studies show, in fact, that mastery learning is highly effective when instruction focuses on high level outcomes such as problem solving, drawing inferences, deductive reasoning, and creative expression (Arredondo & Block, 1990; Mevarech, 1985; Soled, 1987).

Although Bloom considered mastery learning to be neutral with regard to curricular focus and teaching methodology, he believed it could be a powerful supplement to any teacher's instructional procedures. Mastery learning was designed to give teachers a practical and efficient tool to better meet the needs of individual students within the demanding environment of a group-based classroom (Guskey, 1985). As such, it also presents teachers with a means to provide their students with the kinds of experiences educators now recognize as essential to the development of thinking skills and other complex cognitive processes.

Inservice Education and Mastery Learning

As our evidence indicates, mastery learning is given only cursory and, in some cases, inaccurate treatment in most preservice education programs. As a result, implementation efforts over the last 25 years have depended primarily on inservice professional development activities. These activities can take on many forms (Sparks & Loucks-Horsley, 1989). But for the most part, teachers have learned about mastery learning through professional development institutes or locally sponsored staff development programs. These programs have been conducted in all parts of our nation and throughout the world, and have involved teachers from all levels of education, from the earliest elementary grades (Guskey, Passaro, & Wheeler, 1991) to the college level (Guskey & Monsaas, 1979).

The professional development institutes and staff development programs focusing on mastery learning generally have maintained integrity to the ideas set forth by Bloom (1968, 1976). This has occurred for two reasons. The first is that a majority of these institutes and staff development programs have been conducted by former students of Bloom, who

have consistently pressed for program fidelity. Individuals such as James H. Block, Lorin W. Anderson, Judith A. Monsaas, and Thomas R. Guskey have each conducted hundreds of inservice programs to help practicing educators become familiar with mastery learning and the process involved in its implementation. In recent years a new generation of former students of these individuals has continued this work. Robert B. Burns and Perry D. Passaro have been especially active in this area.

A second reason for the high level of fidelity to the ideas set forth by Bloom in inservice programs is that many of these programs are based on the specific guidelines for implementation described in publications by Bloom's former students. In the past 15 years, numerous inservice education programs have been based on Block and Anderson's (1975) book, *Mastery Learning in Classroom Instruction*, Guskey's (1985) book, *Implementing Mastery Learning*, and more recently, Block, Efthim, & Burns' (1989) book, *Building Effective Mastery Learning Schools*. The implementation efforts stemming from these programs generally have been well aligned with Bloom's work and, interestingly, results have been quite impressive (e.g. Guskey & Block, 1991).

Mastery learning is generally well received by teachers involved in inservice professional development programs because they readily see its use does not require them to drastically alter what they are doing. Unlike many new ideas and strategies that are designed to replace teachers' current teaching methods, mastery learning builds upon those techniques. It is seen by many teachers as a means by which they can improve their results with students by making more effective use of skills they already have.

Conclusion

Despite dilemmas regarding the way mastery learning is presented in many preservice education programs, its future looks bright. Many classroom teachers today are coming to recognize the value of the essential elements of mastery learning (Guskey, 1987b). Increasing numbers are coming to see the importance of using assessments as learning tools, rather than simply as devices to categorize students and assign grades. Many also are offering corrective activities to students who may need a little more time or another instructional approach to learn well. They are providing enrichment activities for fast learners who can benefit from the opportunity to extend and broaden their learning. Many, too, are working hard to ensure their instructional methods, feedback and corrective procedures, and assessment strategies are congruent with the learning outcomes they most value. For these teachers mastery learning offers the tools they need to have a more powerful influence on the learning of their students. It empowers them to be more effective and, as a result, makes teaching more rewarding and enjoyable (Guskey, 1980, 1986).

Researchers today also have come to recognize the value of the essential elements of mastery learning and the importance of these elements in effective teaching at any level. As a result, fewer studies are being conducted on the mastery learning process, per se. Instead, researchers are looking for ways to enhance results further, adding to the mastery learning process additional elements that positively contribute to student learning in hopes of attaining even more impressive gains (Bloom, 1984a; Walberg, 1990). Recent work on the integration of mastery learning with

other innovative strategies appears especially promising (Arredondo & Block, 1990; Guskey, 1988b, 1990a, 1990b).

Mastery learning is not an educational panacea and will not solve all the complex problems facing educators today. It also does not reach the limits of what is possible in terms of the potential for teaching and learning. Exciting work is continuing on new ideas designed to attain results far more positive than those typically derived through the use of mastery learning (Bloom, 1984b, 1988). Careful attention to the essential elements of mastery learning will, however, allow educators at all levels to make great strides toward the goal of *all* children learning excellently.

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Table 1

Texts Reviewed for Descriptions of Mastery Learning

(Note: Listed are the text, title of the chapter in which mastery learning is described, and corresponding page numbers.)

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1. Biehler, R. F., & Snowman, J. (1993). *Psychology applied to teaching* (7th ed.). Boston: Houghton-Mifflin.

   "Measurement and evaluation of classroom learning," (pp. 599-609).

2. Dembo, M. H. (1991). *Applying educational psychology in the classroom* (4th ed.). New York: Longman.

   "Behavioral approaches to learning," (pp. 252-257).

3. Eggen, P. D., & Kauchak, D. (1992). *Educational psychology: Classroom connections*. New York: Macmillan.

   ("No references for 'mastery learning')

4. Henson, K. T. (1993). *Methods and strategies for teaching in secondary and middle schools* (2nd ed.). White Plains, NY: Longman.

   "Individualizing instruction," (pp. 151-154).

5. Joyce, B., Weil, M., & Showers, B. (1992). *Models of teaching* (4th ed.). Needham Heights, MA: Allyn & Bacon.

   "Mastery learning, direct instruction, and social learning theory," (pp. 299-300).

6. Kaplan, P. S. (1990). *Educational psychology for tomorrow's teacher*. St. Paul, MN: West.

   "Objectives and teaching strategies," (pp. 374-375).

7. Meyers, C. B., & Meyers, L. K. (1990). *An introduction to teaching and schools*. Orlando, FL: Holt, Rinehart & Winston.

   "Approaches to teaching: A look at five models of instruction," (pp. 359-365).

8. Seifert, K. L. (1991). *Educational psychology* (2nd ed.). Boston: Houghton Mifflin.

   "Meeting individual needs," (pp. 349-353).

Table 1 continued

9. Slavin, R. E. (1991). *Educational psychology.* Englewood Cliffs, NJ: Prentice-Hall.

   "Accommodating student differences," (pp. 292-299).

10. Sprinthall, N. A., & Sprinthall, R. C. (1990). *Educational psychology: A developmental approach* (5th ed.). New York: McGraw-Hill.

    (No reference to mastery learning; mentioned in a brief biography of Bloom, p. 351).

11. Tuckman, B. W. (1991). *Educational Psychology: From theory to application.* Orlando, FL: Harcourt Brace Jovanovich.

    "The design of instruction," (pp. 102-104).

12. Woolfolk, A. E. (1993). Educational psychology (5th ed.). Needham Heights, MA: Allyn & Bacon.

    "Planning to teach: Basic teaching strategies for reaching objectives," (pp. 458-459).

Table 2
Mastery Learning Citations in Various Educational Psychology Texts

Citation	Educational Psychology Texts											
	1	2	3	4	5	6	7	8	9	10	11	12
Early writings:												
Carroll (1963)	X		X	X		X	X		X		X	
Bloom (1968)	X	X				X	X					X
Keller (1968)							X		X			
Block (1971)	X											
Bloom (1971)		X			X							
Carroll (1971)	X				X							
Bloom (1976)							X	X	X		X	
Research reviews:												
Block & Burns (1976)		X				X	X		X			
Arlin (1984a)							X		X			
Guskey & Gates (1986)		X		X				X				X
Slavin (1987)		X						X	X			X
Kulik, Kulik, & Bangert-Drowns (1990)	X											
Implementation guides:												
Block & Anderson (1975)		X						X	X			
Guskey (1985)		X						X				
Block et al. (1989)		X										

Table 2 continued

Citation	Educational Psychology Texts											
	1	2	3	4	5	6	7	8	9	10	11	12
Studies yielding positive results:												
Anderson et al. (1976)							X		X			
Block & Henson (1986)				X								
Hyman & Cohen (1979)				X								
Tenenbaum (1982)									X			
Studies yielding nonsignificant results:												
Arlin (1984b)		X		X			X	X	X			X
Arlin & Webster (1983)									X			
Kersh (1972)		X										
Lueckemeyer & Chiappetta (1981)									X			
Slavin & Karweit (1984)		X							X			
Negative reviews and/or commentaries:												
Cox & Dunn (1979)	X	X				X						X
Grabe & Latta (1981)												X
Groff (1974)							X					
Harvard Ed. Letter (1987)									X			X
Horton (1979)						X	X					
Horton (1981)						X						
Mueller (1973)	X											
Slavin (1989)				X								

Table 2 continued

Citation	Educational Psychology Texts											
	1	2	3	4	5	6	7	8	9	10	11	12
Other associated writings:												
Bloom (1974)		X										
Bloom (1981)			X			X						
Bloom (1984a)									X			
Burns (1979)				X								
Carroll (1985)											X	
Cunningham (1991)				X								
Guskey (1988b)						X						
Stallings, & Stipek (1986)						X	X					